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REPORT

ON THE PROGRESS OF CIVIL AVIATION, INDIA

1933-34



GOVERNMENT OF INDIA

DIRECTORATE OF CIVIL AVIATION

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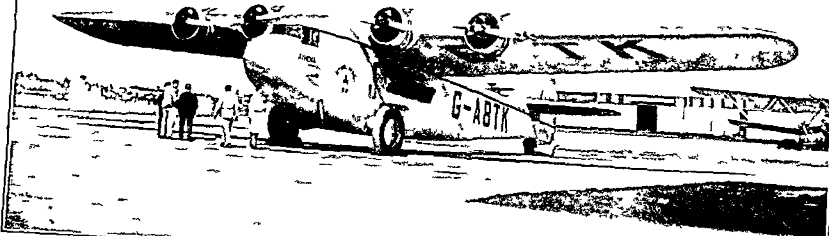
APPENDICES

FOREWORD

As in previous years this Report has been compiled to cover the financial period ending on the 31st March 1934, but, in order to maintain uniformity with other countries, all statistics are given for the calendar year 1933

The increased number of tables in the Appendices is mainly the result of the increased number of air services in operation A further development in the presentation of the detailed analysis of accidents will be found in the relative Appendices.

A new feature of the *Report* is the inclusion of graphs showing the growth of aviation under six representative heads These give, at a glance, a measure of the rate of expansion, and, if the figures relating to Indian aviation, as distinct from flying in India, are examined, they provide the best testimony to the expanding phase which was foreshadowed in last year's Report While development may be slow, there is every evidence that the expansion movement is not a passing phase and that it is steadily gathering force and broadening its basis



Armstrong Whitworth XV (Atalanta) 4 Armstrong Siddeley 340 h.p. Serval engines

Used by Imperial Airways and India Trans-Continental Airways on the trans-India route

(By courtesy of Imperial Airways Ltd.)

SECTION I.

REGULAR AIR SERVICES.

Evidence of the growth of interest in aviation in India is provided by the development of regular air services Certain developments in commercial air transport were foreshadowed in the Report on the Progress of Civil Aviation for 1932 33 In actual fact greater developments have taken place

The first in importance is the extension of the London Karachi air service across India to Singapore with joint operation by Imperial Airways Ltd and an Indian company Indian Trans Continental Airways Ltd This service replaced the Karachi Delhi air mail service Following this Indian National Airways Ltd established a weekly service between Calcutta and Rangoon thus making with the main trans India service a twice weekly service between Calcutta and Rangoon A daily service was also established by Indian National Airways between Calcutta and Dacca

The total mileage of air services in operation in India on the 31st December 1933 was 4 780 compared with 4 260 at the end of 1932 These figures exclude the air route lying outside India in which an Indian operating company participates namely the Rangoon Singapore section of the Australian route The total mileage of air services either operated by Indian companies or in which Indian companies participate is now, therefore 5 180 compared with 2 010 at the end of 1932 A diagram showing the growth of the mileage of Indian operated air services is given at page 4

A feature of the development which has taken place which cannot be passed over without notice is the increase in night flying on the trans India route While regular flying through the night is not yet scheduled there is an increasing tendency to schedule early morning departures involving considerable periods of night flying with the first landing in daylight Again while in the past a delayed service was limited in its capacity to make up time by daylight hours 1933 has seen a great extension of the practice of flying on well into the night and on certain occasions all night This is reflected in the better punctuality returns referred to later and included in the Appendice The trans India air route is not yet even in part organised for night flying but the provision of a few items of lighting equipment at some of the principal aerodrome has contributed The increase of night flying has thrown a corresponding extra strain on the wireless meteorological and aerodrome organisation a matter of no small moment on a route of 2 000 miles in length

NEW COMPANY ORGANISATION

In order to understand the developments which have taken place in air transport services in India during the year 1933 it is necessary to explain the new company organisation in which arrangements for the operation of the trans India air service are linked with the development of internal air services

Indian Trans Continental Airways, Ltd —The fundamental basis of the organisation lies in the arrangements made with His Majesty s Government in the United Kingdom and Imperial Airways Ltd for the extension of the main London Karachi air service across India from Karachi to Singapore as a link in the England Australia air service which is being organised Indian Trans Continental Airways Ltd was formed as an Indian company with a capital of rupees 10 lakhs The company is a private company in which the shares are held by the Government of India 24 per cent Imperial Airways Ltd 51 per cent and Indian National Airways Ltd 25 per cent The agreement covering the operations provides that this company will operate alternately with Imperial Airways a weekly air service from Karachi to Singapore in continuation of the London Karachi service The fleet of the two companies is homogeneous and the technical control and management of the two companies is combined The sphere of operations of Indian Trans Continental Airways is confined to co operation with Imperial Airways Ltd in the main trans India air service The company is controlled by a Board of Directors established in India of whom the majority are Indians The Directors are nominated as follows —

By the Government of India	1
By Indian National Airways Ltd	2
By Imperial Airways Ltd	4

In addition to the Government Director the Director of Civil Aviation also attends meetings of the Board as a representative of the Government of India

In consideration of the representation of Indian capital in this company both Indian Trans Continental Airways and Imperial Airways are permitted to carry mails across India and to operate for the carriage of internal air traffic on the main air service The companies receive a cash subsidy from the British Government which subsidy is equally divisible between the two companies The Government of India contribute a further subsidy in the form of a remission of [illegible]
aircraft spares petrol oil etc and [illegible]
at Indian aerodromes In consider[illegible]
subsidy India is admitted to be a State contributing towards the maintenance of the main Empire air service from England

to Australia from which springs a very definite benefit to India By virtue of this position and in common with other contributing States within the British Empire India is permitted to settle charges for the carriage of air mails on the England Australia route in sterling instead of gold francs The resulting benefit equals the subsidy paid and it has been passed on to the corresponding public in India in the shape of reduced air mail surcharges The period of operation of the agreement terminates on the 31st March 1939, concurrently with the termination of the main subsidy agreements between Imperial Airways and the British Government

Provision has been made for the engagement and training of Indian personnel in all branches of the service operated by Indian Trans Continental Airways In actual fact a number of Indians is employed by both companies in India and elsewhere Provision has also been made whereby the technical advice of Imperial Airways is available in the establishment of feeder services by Indian National Airways

Indian National Airways Ltd —The company has been established to participate as a share holder in Indian Trans Continental Airways and to develop feeder and other internal air services in north India It is registered in India with an authorised capital of Rs 30 lakhs In consideration of the participation of the company in Indian Trans Continental Airways the Government of India have agreed to a concession to the company with regard to subsidised air services and contract air mail services in the region lying within India to the north and east of the main trunk route Within this region no subsidy or air mail contract to an air service will be granted by Government unless Indian National Airways have first been given the opportunity to operate the service

The initial capital has been privately subscribed from sources representing widespread interests in India The establishment of the company is due to Messrs Govan Bros Ltd of Delhi who act as managing agents In addition to a number of Indian interests a technical nucleus for the company is provided by the participation of Indian Air Survey and Transport Ltd Dum Dum Bengal a company which has had long experience of air survey and other operations in India and to whose participation the developments in Eastern Bengal and Burma referred to elsewhere are due A further technical nucleus in the company is provided by the participation of Air Work Ltd of Heston Middlesex who act as the agents in England

Under the arrangements for the establishment of Indian Trans Continental Airways Indian National Airways act as the principal agents in India and Burma for both Imperial Airways and Indian Trans Continental Airways

The Madras Air Taxi Service—Another new operating concern established during the year 1933 is due to the initiative of Raja I V Krishna Row and Mr I V Bhujanga Row, who operate under the name of the Madras Air Taxi Service their initial aim being the operation of an air taxi service and the establishment of the Calcutta Madras service referred to later in this Report

INDIAN INTERNAL SERVICES

Karachi Bombay-Madras air mail service—While the expected extension of this air service to Colombo did not take place, owing to difficulties experienced in the provision of an aerodrome in Ceylon the success attending the operation of the service between Karachi and Madras exceeded expectations

The service achieved a regularity of 100 per cent and a punctuality almost equally good during the year 1933 There were seven occasions when the southbound service was delayed by periods of from one to three days on account of the late arrival of the main air service at Karachi In one week only was there a delay of one day in the southbound service due to unserviceability of aircraft On no occasion did the service fail to make a connection at Karachi with the westbound Imperial Airways service

A very great increase in the air mail loads carried on the service took place during the year The service operated only during a part of the previous year and annual totals cannot therefore be compared but the increase is illustrated by the figures for the first quarter and the last quarter of the year 1933 The total mail carried in the first quarter of the year was 3 918 lbs The total mail carried in the fourth quarter was 8 906 lbs an increase of 127 per cent in nine months A considerable part of this increase is attributable to the introduction by the Indian Posts and Telegraphs Department of a revised system of surcharges which is referred to elsewhere At the same time a steady and continued increase in the load of mails in the southbound direction that is mail originating abroad testifies to the utility and growing popularity of the service A fe

were carried by the

remained essentially a

for the service are given in Appendix I

An important change in the route operated was effected during the

difficult region

a in monsoon

ober Bombay

was eliminated and the service operated *via* Poona By this means, it was made possible for the aircraft to reach the eastern side of the Ghats *via* the comparatively easier route of the Tapti Valley at the north end of the Ghats This modification of the air route will not necessarily be repeated during every monsoon but until the

Juhu aerodrome at Bombay is sufficiently consolidated to make it serviceable throughout the monsoon and until the route is completely organised wit
navigation the aircraft
is likely to be an annual

No changes in the time table of the service were effected, other than those necessary to correspond with changes in the time table of the main air service between Karachi and London

The fleet of aircraft employed on the service at the end of the year consisted of two De Havilland Puss Moths and one De Havilland Fox Moth

Karachi Delhi air mail service—In accordance with the agreement with the Delhi Flying Club the Karachi Delhi air service was operated by that club with a De Havilland Gipsy Moth until the inauguration of the Karachi Calcutta section of the Australian route on the 7th July

The Delhi Flying Club and their air mail pilot deserve commendation for the regular operation of this service during a period of 18 months The service served the purpose for which it was designed namely to avoid an interruption in the Karachi Delhi service (which was first established at the beginning of 1930) pending the completion of negotiations for the extension of the main trunk air service across India As was expected the air mail loads remained practically constant up to the end of the operations the average load of mail carried on each flight being 101 1 lbs compared with 96 8 lbs in the year 1932 The service was operated with a good measure of regularity it failed to connect with Imperial Airways westbound departure from Karachi on two services out of 28 and on these occasions the mail was connected with the aid of the Air Orient service

Statistics covering the operations during the year 1933 will be found in Appendix II

Trans India service—The extension of the London Karachi air service across India from Karachi to Singapore which was effected during the year is dealt with under the heading of external and foreign air services the main importance of the service lying in its international aspect At the same time it replaced the Karachi Delhi air mail service and provided an internal air service serving the whole of north India and Burma from Karachi to Calcutta and Rangoon

Calcutta-Rangoon air service—On the 1st December 1933 Indian National Airways established a weekly air service between Calcutta and Rangoon intermediate between the services operated by Indian Trans Continental Airways and Imperial

Airways thus providing a twice weekly service for passengers mail and freight between Calcutta and Rangoon as follows —

	Indian National Airways	Indian Trans Continental Airways
Calcutta Rangoon	Tuesday	Sunday
Rangoon Calcutta	Friday	Tuesday

The service operates via Chittagong Akyab and Bassein The time taken on the journey is approximately 9¼ hours which compares with the sea passage of 2½ days (5 days and 2 nights) The Indian Trans-Continental and Imperial Airways service it may be noted while faster between Calcutta and Rangoon stops only at Akyab The service was inaugurated with Dragon Moth aeroplanes arranged to carry a crew of 2 (pilot and wireless operator) and 5 passengers or a total pay load of about 1 200 lbs

No air mail contract has been entered into with the Company but a short term agreement to use the service for the carriage of air mails on payment of a poundage rate has been effected

As a passenger service the new service proved to be in considerable demand though air mail and freight traffic was inconsiderable During the first month the service carried 42 passengers Up to the 31st of March 1934 the number of passengers was 133

Operational statistics for the period up to the 31st December 1933 are given in Appendix III

Calcutta-Dacca air service—On the 1st December 1933 Indian National Airways established a daily passenger mail and freight service between Calcutta and Dacca This service is of particular interest as being the first daily air service established in India The reason for the selection of this particular route lay in the belief of the promoters that the speeding up of communication with the jute districts of Eastern Bengal would prove of value to the public and that the service would be in considerable demand The railway system in Eastern Bengal is incomplete on account of the unbridged Ganges and Brahmaputra rivers Journeys therefore involve a combination of rail and river transport and apart from speed comfort is much impaired thereby Apart from the important jute growing region around Dacca the communications of both Chittagong and the tea districts of Assam are impaired by the lack of through rail communication Should this daily air service prove successful therefore further developments in this direction are contemplated

The service takes approximately 1¼ hours in each direction it is operated in both directions in the morning The time taken by the rail and steamer journey from Calcutta to Dacca is 16½ hours

Insufficient experience has been gained to show whether or not the service will be justified During the first month 105 passengers were carried Mail loads were regular but insignificant while there was an interesting and increasing demand for freight space (mainly newspapers) from Calcutta to Dacca

The service is normally operated by a De Havilland Dragon aeroplane which however is occasionally relieved by a De Havilland Fox Moth when traffic does not warrant the use of the larger machine

As in the case of Indian National Airways Calcutta Rangoon service no air mail contract has been entered into with the company but a short term agreement to use the service for the carriage of air mails on payment of a poundage rate has been effected

Operational statistics of the service for the period ending 31st December 1933 are given in Appendix IV

Calcutta Madras air service—On the 10th February 1934 the Madras Air Taxi Service inaugurated an experimental twice weekly service between Calcutta and Madras with halts at Puri Vizagapatam and Bezwada (Gannavaram) It was decided to discontinue the service on the 31st March 1934

Projected developments—The projected extension of the Tata air service to Ceylon is as referred to elsewhere still under negotiation with the Ceylon Government

Negotiations have been carried on with Indian National Airways for the establishment of an air mail service between Karachi and Lahore The conclusion was reached that in present conditions a passenger service could not be successfully operated on this route and the negotiations were directed towards establishing a basis of agreement on which an air mail service could be operated It proved impossible to bring the service into operation during 1933 but it is hoped that developments in this connection will take place during 1934

Discussions have taken place with regard to the operation of a daily air service between Calcutta and Bombay

EXTERNAL AND FOREIGN AIR SERVICES

Imperial Airways' London Karachi service—No changes of major importance in the operation of the service route time table or fleet took place during the year In December 1933 simultaneously with the extension of the air service to Singapore the day of departure from Karachi was postponed from Wednesday to Thursday with a correspondingly later arrival in London On the speeding up of the service in April 1934 the time table reverted to a Wednesday departure

A considerable improvement in the punctuality of operation of the service was effected, as compared with the previous year Out of 52 services operated to Karachi, 45 arrived punctually, compared with 36 in the preceding year The punctuality of the British service compares favourably with that of the other services Punctuality returns are combined with those of other external air services carrying Indian mails and mails to India (in Appendix VII) for the years 1931, 1932 and 1933

The actual time taken by the service on flights eastbound and westbound between London and Karachi is shown below —

Eastbound		Westbound	
No of flights	Day of arrival	No of flights	Day of arrival
45	7th	44	7th
4	8th	8	8th
2	9th		
1	10th		
52		52	

In last year's Report it was remarked that the time saving as compared with the sea mail service was considerably impaired by the absence except to south India of internal air services in India The establishment of the trans India service during the year has gone a long way to remove this disability

There has been an improvement during the year in the quantity of mail carried to and from India as shown in Appendix VI The increase amounts to 27 per cent in the inward direction and 29 per cent in the outward direction This corresponds with a general increase in the use of the British Empire air mail services but specific reasons are not only the improvement of the service by connecting services in India but also the revision of Indian air mail surcharges which is referred to elsewhere The weight of inward mails was 24 6 tons and the weight of outward mails 24 2 tons It is significant that the loads of mail to and from India are now virtually equal since the total charge including postage, on an air mail letter from India is still in excess of the corresponding charge from Great Britain

The growth of the air mail is illustrated in a diagram at page 14 Complete mail statistics are given in Appendix VI, combined with the figures of foreign air services Further operational statistics, including passenger and freight traffic, are given in Appendix VIII

Karachi Singapore service—The arrangements made for the operation of the air service between Karachi and Singapore are detailed earlier in this section of the Report

The fleet operating the service is homogeneous and consists of four Armstrong Whitworth XV (Atalanta) two owned by Imperial Airways and two by Indian Trans Continental Airways The machines are high wing cantilever monoplanes fitted with four 340 h p Armstrong Siddeley Serval radial air cooled engines They have a maximum speed of about 150 miles an hour and normally cruise at about 118 miles an hour The crew consists of Captain First Officer and Wireless Operator The cabin provides accommodation for 9 passengers and there is in addition accommodation for a large load of mail passengers luggage and freight The wireless installation is very complete it provides telephonic and telegraphic communication on long and short wave and the Marconi Robinson direction finding system which enables the machine to be steered towards a ground transmitting station

The first stage of the extension from Karachi to Calcutta was [illegible] October the service [illegible] nber from Rangoon [illegible] the first machine [illegible] st day of the year 1933 The service operates *via* Jodhpur Delhi Cawnpore Allahabad Calcutta Akyab Rangoon Bangkok and Alor Star From the date of the extension to Singapore till the end of the year under review (31st March 1934) the service was operated to the following schedule —

Eastward	Karachi	Dep	Friday	Evening
	Singapore	Arr	Tuesday	Noon
Westward	Singapore	Dep	Sunday	Noon
	Karachi	Arr	Thursday	Morning

From the 15th April 1934 a speeded up schedule has been introduced whereby machines leave Karachi on Thursday afternoon and arrive at Singapore on Sunday evening and in the opposite direction depart from Singapore on Sunday morning and arrive at Karachi on Wednesday morning

From its inauguration on the 7th July till the end of 1933 the service was operated with nearly 100 per cent regularity though *from a variety of causes the service did not settle down to punctual* running for some time The causes included engine trouble monsoon weather conditions and unserviceability of aerodromes and delays consequent on the arrival of the main service at Karachi The only serious mishap was the damage of the rear end of the fuselage of G ABTK (Athena) in landing at Asansol on the second eastbound service This is largely attributable to the unserviceability of the aerodrome Passengers and mail had to be sent on by train and the machine was immobilised for three weeks As a result Asansol was cut out of the schedule and extra petrol tanks had to be fitted for the long stage from Allahabad to Calcutta

The punctuality of arrival at the terminus Calcutta or Rangoon, is shown in the following table —

Terminus	Sche duled Services	Punc tual	1 day late	2 days late	3 days late
Calcutta (from 7th July to 30th September)	13	7	3	2	1
Rangoon (from 1st Octo ber to 31st December)	14	12	1	1	

The causes of delays were as follows —

	Number
Late arrival of Imperial Airways at Karachi	3
Mechanical faults	1
Landing grounds	2
Weather	2

All the westbound services were punctually operated

From the 7th July to 31st December 7 797 lbs of mail was carried by the service in the eastward direction and 13 888 lbs in the westward direction Expressed in another way a total transport of 12 870 mail ton miles 160 040 passenger miles and 1 520 freight ton miles was effected

There
of operati
service

	July	December
Average load of mails per flight lbs	371	569
Total passenger miles	13 220	52 175
Total freight ton miles	183	529

Detailed statistics are given in Appendix V

K L M (Royal Dutch Air Lines) and Air France services — Again no major developments in foreign air services to or across India have to be recorded Both the Dutch service from Amsterdam to Batavia and the French service from Paris to Saigon were operated unchanged throughout the year

It is not without significance to India that both these companies laid plans during the year for the provision of larger and faster aeroplanes Both operated experimental fast flights and the K L M introduced a new and speeded up time table The time

tables of the companies at the end of the year provided the following service —

Amsterdam to Karachi	5¼ days
Paris to Karachi	5½ days

The first of the Dutch demonstration flights was carried out by PH AIP (The Pelican) a Fokker XVIII aeroplane The machine left Amsterdam early in the morning (0410 hrs) on the 18th December 1933 and arrived in Batavia at 0850 hrs on the 22nd December, thus completing the flight in a little over four days On December 26th the machine left Batavia to fly back to Amsterdam and the return flight was made in 4 days 4 hours and 24 minutes

The second flight was carried out by the Pander Post Jager PHOST It left Amsterdam on the 9th December but soon after leaving Rome the machine made a forced landing due to engine failure The flight was resumed after another engine was obtained from America and the machine arrived in Batavia on the 2nd January The flight from Amsterdam to Batavia a distance of 9 000 miles was completed in a flying time of 46 hrs 5 minutes The aeroplane left Batavia on the 7th January on the return journey but was held up at Calcutta for a day due to engine trouble

A particular feature of these flights was that long sections were flown at night including much of the route through India where special wireless meteorological and aerodrome organisation was provided

On December 22nd the new high speed Dewoitine 247 type aeroplane (F AMMY) which was used by Air France for their demonstration flight from Paris to Saigon and back left Le Bourget and after two nights and a day in Rome arrived in Saigon on the 29th December thus covering a distance of 7 140 miles in a flying time of 48 hours It has however to be recorded with great regret that the machine met with disaster on its return flight in France with the loss of all crew and passengers

The number of flights carried out by the K L M and Air France services across India during the year 1933 was—

	Eastbound	Westbound	Total
Dutch	52	53	105
French	52	52	104

It is of interest to note that a reorganisation of the French air transport companies was effected during the year resulting in a single large company which is known as Air France In consequence the concession to operate across India which was granted to the Air Orient was transferred to Air France

The concession whereby the Dutch and French air services were used for the carriage of air mails from India to certain countries in the east, did not result in a large volume of mails being so carried Since December 1933 when the British and Indian air service was extended to Singapore all mails for countries served by that service have been so despatched and are no longer sent by the K L M and Air France services

Statistics with regard to the weight of air mails carried by these services to and from India are given in Appendix VI

Operational statistics including passenger and freight traffic data are combined with those of Imperial Airways in Appendix VIII

Punctuality returns of these services are combined with those of Imperial Airways in Appendix VII

IMPORTS AND EXPORTS BY AIR

The year under review saw a further rise in the number of aircraft which cleared customs at the Indian air ports and the value of imports and exports by air

The number of aircraft arrivals from abroad increased from 271 in 1932 to 316 and the number of departures for places abroad from 268 to 302

The value of merchandise imported during the year was Rs 50 60 311 compared with a value of Rs 8 28 786 during 1932 About 60 per cent of the merchandise imported consisted of diamonds The imports of bullion and currency notes rose from Rs 33 766 in 1932 to Rs 1 77 335 in 1933

The value of merchandise exported was Rs 44 206 against Rs 15 353 in 1932 The exports of bullion and currency notes dropped from Rs 24 58 563 to Rs 1 02 700

Detailed statistics are given in Appendix IX

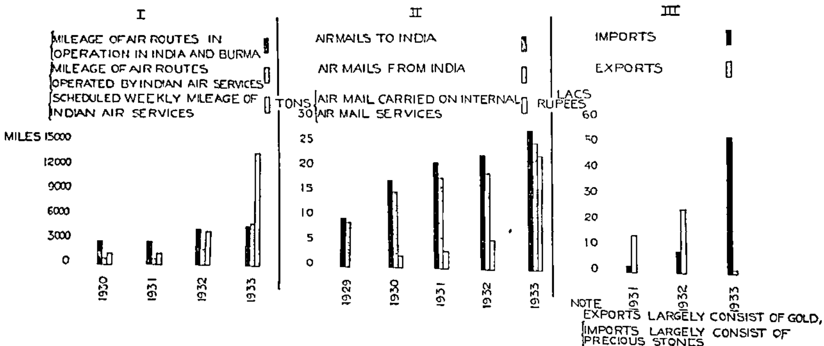
AIR MAIL SURCHARGES

The significance of air mail developments in India during the year 1933 cannot be appreciated without a reference to the change in the system of surcharges which was made effective concurrently with the establishment of the first link in the trans India service on the 7th July Prior to that date there had existed an additional surcharge for the carriage of outward foreign articles on any air service within India to the air port of departure *ex* India namely, Karachi As an example the surcharge on a ½ oz letter to Great Britain in addition to postage was 6 annas from Karachi and 8 annas for carriage from a place on an air service in India This principle had the effect of seriously limiting the use of Indian air services and therefore militating against their development, as senders had the option of not paying the extra charge

for internal conveyance by air The general tendency with regard to air mail surcharges is gradually to establish flat rates over wider zones following for example the change which took place some years ago in Europe when in place of a number of complicated differences in surcharges from Great Britain to continental countries a flat rate of 4*d* per oz to any country in Europe was established While the popular demand for the elimination of air mail surcharges cannot in present conditions be brought about on account of the comparatively high cost of air transport the reduction and simplification of air mail surcharges is an end which is being pursued

On account of a revision of the system of settling air mail accounts with the British Post Office resulting from the trans India agreement it was possible not only to establish a flat rate of surcharge from any place in India and Burma to a particular destination abroad but to do so by eliminating the internal air mail surcharge of 2 annas per ½ oz letter The air mail surcharge therefore became as from 7th July 1933 6 annas per ½ oz letter from India or Burma to Great Britain as compared with the pre existing rate of 8 annas The result in the development of air mail traffic not only on Indian services but on the main Karachi London service is shown in the statistical tables

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GROWTH OF AVIATION IN INDIA
I
MILEAGE OF AIR ROUTES IN OPERATION IN INDIA AND BURMA
MILEAGE OF AIR ROUTES OPERATED BY INDIAN AIR SERVICES
SCHEDULED WEEKLY MILEAGE OF INDIAN AIR SERVICES
MILES 15000
12000
9000
6000
3000
0
1930
1931
1932
1933
II
AIRMAILS TO INDIA
AIR MAILS FROM INDIA
AIR MAIL CARRIED ON INTERNAL AIR MAIL SERVICES
TONS
30
25
20
15
10
5
0
1929
1930
1931
1932
1933
III
IMPORTS
EXPORTS
LACS RUPEES
60
50
40
30
20
10
0
1931
1932
1933
NOTE
EXPORTS LARGELY CONSIST OF GOLD,
IMPORTS LARGELY CONSIST OF PRECIOUS STONES

SECTION II.

FLYING CLUBS AND PRIVATE FLYING.

Flying Clubs—Progress in the flying club movement was sustained. The flying returns summarised in Appendix X show a total of 10 995 hours flown as against 9 700 in 1932, an increase of three in the number of aeroplanes operated by flying clubs but on the other hand a considerable decrease (from 8[illegible] to 68) in the number of *ab initio* pilots trained. More flying was done by pilots undergoing advanced training for A1 and B licences while probably licensed pilot members of the clubs used the aeroplanes more for their own pleasure and business but at the same time, part of the increase in flying hours is due to an increase in joy ride and taxi flights taken by the public. During the year it was necessary to lay down certain general rules for the guidance of the subsidised flying clubs to prevent unfair competition in commercial operations with unsubsidised commercial concerns. The more important developments were the inauguration of a separate U P Flying Club and the resurrection of club flying in the Punjab through the Northern India Flying Club.

The U P Flying Club has its headquarters at Lucknow and a branch at Cawnpore. It was originally a branch of the Delhi Flying Club but since March 1933 has operated as a separate club. Provision was made in the budget for the grant of the usual subsidy and bonus to the new club. In March 1934 the U P Government made a contribution of Rs 12 000 to the club for the purchase of an aeroplane.

The Northern India Flying Club commenced operations at Lahore on the 1st October 1933 under a subsidy agreement with Government. The new club is intended to replace the Punjab Flying Club which has been placed in liquidation.

The Madras Flying Club opened a branch at Trichinopoly in April 1933 with an additional pilot instructor for that centre.

The flying clubs now in existence in India are—

BRITISH INDIA

Subsidised

- The Delhi Flying Club Delhi.
- The Karachi Aero Club Karachi.
- The Bombay Flying Club Bombay.
- The Madras Flying Club Madras (with a branch at Trichinopoly).
- The Bengal Flying Club Dum Dum.
- The U P Flying Club Lucknow and Cawnpore.
- The Northern India Flying Club Lahore.

Unsubsidised

The Kathiawar Flying Club Ahmedabad

INDIAN STATES

The Jodhpur Flying Club Jodhpur

Proposals are under consideration by H E H the Nizam's Government for the formation of a flying club at Hyderabad

The Aero Club of India and Burma remained the representative of the Federation Aeronautique Internationale in India and the co ordinating body between Government and the flying clubs and to an increasing extent has taken responsibility for the work in connection with air tours from and to India Working arrangements with the Royal Aero Club and the Automobile Association in Great Britain have been effected in this connection

The grant for subsidy to the flying clubs in 1933 34 was maintained at the same figure Rs 1 30 000 but since new clubs were subsidised the individual grants were reduced The subsidy allotted to the flying clubs at Delhi Karachi Bombay Madras Calcutta and Lucknow was as follows —

	Rs	
Fixed subsidy	16 000	(Compared with Rs 17 000 in the preceding year)
Bonus at the rate of Rs *100* for each pilot trained *ab initio* and licensed	2 000	
Total	18 000	

The subsidy to the Northern India Flying Club was fixed at Rs 10 500 at the rate of Rs 3 500 a quarter for the period of operation *plus* Rs 1 500 in the form of earned bonus Since the club did not commence operations until the 1st October the first quarter's subsidy was allocated as a special grant towards the purchase of an aeroplane for the club The Aero Club of India and *Burma received a reduced subsidy of Rs 5 000* as compared with Rs 10 000 in the preceding year

In the year 1934 35 it has been decided with the same total allotment to make a fixed grant of Rs 17 000 to each of the seven existing flying clubs and Rs 11 000 to the Aero Club The maintenance of the latter is considered essential while owing to the impossibility of a long term programme and the consequent difficulty of framing a scheme whereby the major portion of the subsidy is *based on earnings the bonus* payments to the flying clubs will be, for the present eliminated

The number of aircraft owned by the flying clubs increased from 26 in 1932 to 29 in 1933 and the total number of flying hours, from 9,717 to 10,995 Membership increased from 1,538 in 1932 to 1,750 at the end of 1933 The number of pilots trained *ab initio* during the year was 68 as against 55 in 1932 Of this number, 39 were Indians and 29 Europeans The following table shews the number of persons who obtained A1 B and Pilot Instructor's licences during the year 1933 as a result of the training given by the flying clubs —

A1 licence (8 Indians and 2 Europeans)	10	U P Flying Club	4
		Delhi ,, ,,	1
		Bengal ,, ,,	1
		Bombay ,, ,,	2
		Madras ,, ,,	2
B licence . . (3 Indians and 1 European)	4	Delhi ,, ,,	3
		Bombay ,, ,,	1
Pilot Instructor's licence. (1 European)	1	Delhi ,, ,,	1

The total number of Indians employed by the flying clubs on the 31st December 1933 was 128 against 108 on the 31st December 1932 Of this number, 48 were employed in the workshops

A comparative analysis of the accounts of the five subsidised clubs for the year 1932-33 shows that the cost of flying to the clubs was approximately Rs 55 per flying hour, while the receipts, including the Government subsidy, amounted to a little over Rs 52 There has been a general and progressive reduction in the cost of flying while as a result of discussion of the problem at conferences arranged by the Aero Club of India and Burma, flying fees have been raised and receipts per flying hour have improved There is still a wide margin of difference between costs and earned income, since the subsidy paid by Government represents an amount varying from Rs 8 4 to Rs 21 per flying hour

Private Aeroplanes.—The number of privately owned aeroplanes on the 31st December 1933 was 37, as against 32 in the year before

Viceroy's Trophy Air Race.—The air race for the Viceroy's Trophy in 1934 has been postponed to December

International Flights.—The number of air tours carried out to and across India and from India to foreign countries during 1933 was 31 (1932—26) These were distributed as follows —

British	15
Indian	3
Australian	2
French . . .	5

Unsubsidised

The Kathiawar Flying Club Ahmedabad

INDIAN STATES

The Jodhpur Flying Club Jodhpur

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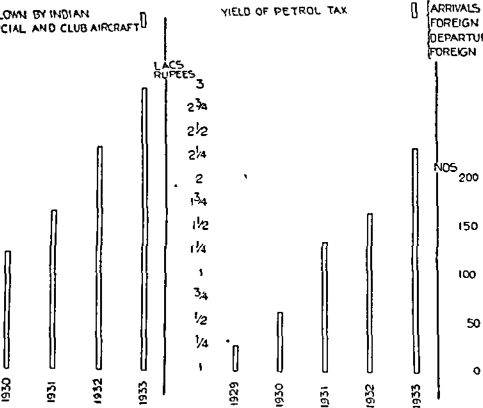
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GROWTH OF AVIATION IN INDIA



SECTION III.

ACCIDENTS.

During the year 1933 15,240 hours of flying were carried out by Indian aircraft and 29 aircraft accidents in India were recorded compared with 11,5 0 hours flying and 22 accidents during the previous year. Of the 29 accidents three occurred to aircraft registered outside India whilst four in which aircraft registered in British India were involved were all outside the classification of flying accidents—a flying accident being one which occurs between the commencement and cessation of taxying.

Of the four non flying accidents three were due to the pilot starting the engine with the throttle open no chocks under the wheels and no one in charge of the controls. This resulted in the machine running off out of control and either nosing over or running into an obstruction. Such accidents can be attributed only to carelessness on the part of the pilot. Notice to Airmen No 38 of the year 1934 and Notice to Aircraft Owners and Ground Engineers No 20 of 1934 lay down rules on the subject the observance of the requirements of which should obviate the recurrence of any accident of this type. The fourth non flying accident was unfortunately fatal involving the death of a passenger—a young boy of 13 who at the conclusion of his first flight jumped off the front of the lower main plane his head was struck by the airscrew. He sustained very serious injuries to which he succumbed in three days.

The results of the investigation of all flying accidents are recorded on standardised forms and an 'Aircraft Accident Analysis Form' completed in respect of each accident.

During 1933 there were four major flying accidents in India including three non fatal accidents to Indian aircraft and one fatal accident to a foreign pilot flying across India.

Of the 22 flying accidents which occurred to aircraft registered in British India five resulted in write off of the aircraft five in damage necessitating complete overhaul and 12 in damage necessitating renewal of major components. The distribution of accidents in India is shown in Appendix XI.

In regard to the cause of the flying accidents the following table is built up from the classification given on the analysis forms for 1932 and 1933 —

Class	Nature	Number 1933	Number 1932
F	Landing Accidents	8	6
D	Spin or stall without engine failure	5	4
G	Take off accidents	4	
E	Forced landings	2	6

Class	Nature.	Number 1933	Number 1932
"B".	Collisions in full flight with objects other than aircraft	2	1
"H"	Taxying accidents	1	2
"N"	Structural Failure*		1
	Total	22	20

* Unregistered and uncertified aircraft

The causes of the accidents in 1932 and 1933 are shown in percentage form in Appendix XII, from which it will be noticed that during 1933, 85 7 per cent of the blame for accidents is attributed to the pilot, 2 2 per cent was due to failure of or defect in the aircraft or engine and 12 1 per cent to miscellaneous causes such as weather airport, etc

The major accidents are briefly described below —

Indian Registered Aircraft —(1) An inexperienced pilot, flying through bad weather was manœuvring for position to and when the aeroplane stalled and crashed The pilot sustained serious injuries and the damage to the airframe necessitated renewal of several major assemblies

(2) A pilot on a cross country flight flew into fog In coming down to locate his position, the aeroplane struck a tree and crashed The pilot sustained serious injuries while his passenger escaped with minor cuts and bruises The aeroplane was written off

(3) A pilot, on coming into land at an aerodrome, misjudged his height and the aeroplane struck a tall tree and crashed The pilot sustained serious injuries, while his passenger was fortunate in receiving only minor injuries The damage to the aeroplane necessitated a complete overhaul

Foreign Aircraft —(4) An Italian aeroplane, which left Calcutta for Rangoon on the night of the 14th April 1933 in the course of a world flight, was reported missing Later, portions of the wreckage were washed up on the shore of one of the islands in the Ganges Delta While there is no evidence to shew the exact cause of the accident, it is assumed that bad weather was the cause, the pilot left Calcutta in spite of warnings of dangerous weather conditions The pilot's body was not recovered

In Appendix XIII the major accidents to Indian aircraft are compared with hours and miles flown While in 1933 there was no fatal accident the mileage flown for each accident involving serious injury increased from 248 000 in 1932 to 400 000 in 1933

SECTION IV.

MISCELLANEOUS FLYING AND COMMERCIAL ACTIVITIES.

De Havilland Aircraft Co, Ltd.—The firm continued to maintain its Indian sales and service branch at Karachi During the year 1933 there was a considerable improvement in sales, as will be observed from the sales statement below —

	Rs
7 Fox Moths with Gipsy Major engines 1 Puss Moth with Gipsy III engine 1 Metal Moth with Gipsy II engine 1 Wooden Moth with Gipsy III engine 1 Gipsy Major engine 1 Gipsy I engine 2 Metal Moth airframes 1 Float undercarriage for Fox Moth	1 90 015
2 Dragons	94 571
Total	2 84 586

The value of the sales during 1932 33 was Rs 77 300

In addition to the usual maintenance and major repair work the Company prepared three Puss Moths and two Moths for certificates of airworthiness and overhauled seven Gipsy engines

The Company carried out a considerable amount of demonstration flying during the year amounting to 100 flights, totalling 111 hours and covering 10 970 miles

Imports of aircraft and aircraft material—The total value of the imports of aircraft and aircraft material into India during the year 1933 was Rs 8 18 174 compared with Rs 3 19 064 in 1932 the large increase being due to the import of Atalanta and Dragon aeroplanes for the fleets of Indian Trans Continental Airways and Indian National Airways

Air Survey and Photography—Indian Air Survey and Transport Ltd Calcutta continued their programme of air survey during 1933 Of a total of 268 hours flying compared with 182 hours during 1932 220 hours were spent on photographic survey work The area of vertical air survey photography was 2 500 square miles compared with 877 5 square miles during 1932

The aeroplanes used by the company were one De Havilland Puss Moth and one Avro Avian The staff employed amounted at one time during the year to 5 Europeans (Pilots and Ground Engineers) and 101 Indians in the Workshop Office Drawing Room and Dark Room The latter staff is variable and depends on the fluctuating state of contract work

Taxi flights —The following table shews the amount of non-regular air transport performed during the year 1933 —

Company or Organisation	*Journeys*	*Hours flown*	*Miles flown*	*Passengers.*
Tata Sons Ltd	2	4	Not known	2
Madras Air Taxi Service	13	76	7 001	16
Flying Clubs	27	123	11 011	26
Total	42	203	18 012	44

Joy Riding —The amount of Joy ride flying carried out during the year 1933 was as follows —

Company or Organisation	*Flights*	*Hours flown*	*Passengers*
Indian National Airways Ltd	124	31	706
Madras Air Taxi Service	537	56	1,141
India Air Pageants Ltd	No information	98	2 858
Flying Clubs	Do	457	3 806
Total		642	8 511

The number of passengers carried on joy rides in 1932 was 4,072

India Air Pageants —India Air Pageants, Ltd, a company registered in Bombay by Captain C D Barnard and Flight Lt A. H Dalton arrived in India in December to give a series of air displays The company arranged to co operate with the flying clubs in India Displays were given at various centres in British India and in the Indian States The venture has proved successful, in that large crowds have been present at the displays and a large number of the public have availed themselves of the opportunity to take flights

Six aircraft were brought to India for the tour, including the Fokker single engined monoplane (The Spider) two Fox Moths, one Tiger Moth one Spartan 3 seater and a Low Wylde Drone. Up to the 31st December the organisation flew 98 hours and carried 3 215 passengers including 357 free By the end of the tour they completed a total of 759 hours 19 204 paying passengers and 2 025 free passengers One minor accident occurred at Dum Dum The Drone which touched the water during low flying over a tank, was wrecked The pilot escaped with minor injuries

Bihar and Orissa Earthquake —It is gratifying to record that India Air Pageants Ltd who were in Patna at the time were able to render assistance during the earthquake disaster in Bihar and

Orissa. Two members of the Company, Messrs Dalton and Palmer, flew immediately to Muzaffarpur from Patna. Difficulty was experienced in landing at Muzaffarpur owing to the damage done to the landing ground. As the town was cut off from outside communication the pilots were able to allay the general anxiety to some extent by conveying news from outside and carrying messages to Patna. Several photographs were taken and a fairly accurate account of the damage done was reported to the Government of Bihar and Orissa.

What follows is a statement by the Bihar and Orissa Government of the assistance derived from the use of aeroplanes in connection with the earthquake.

The severe earthquake which visited Bihar on Monday the 1[illegible]th January resulted in the destruction of all normal means of communication, road, rail and telegraphic, between Patna, the capital of the province, and the districts north of the Ganges. The isolation of the badly affected areas would have continued for days, in some parts for weeks, had it not been for the invaluable assistance afforded by the use of aeroplanes.

Some twenty four hours after the disaster a private aeroplane landed in Patna and reported the results of a reconnaissance over three of the affected districts. On the succeeding day further reconnaissance flights were carried out by this aeroplane and a machine specially chartered by the Bihar Government. By the third day almost the whole of the affected area had been observed from the air and the Bihar Government were able to form a general impression of the extent of the damage and to locate the areas which had suffered most. An aeroplane was also used by Messrs Begg Sutherland of Cawnpore to get into touch with the sugarcane mills in which they were interested.

Normal communications were slowly re-established, but the aeroplane continued to demonstrate its utility. His Excellency the Governor and other high officials were able to visit isolated towns, confer with the local officers and return to their headquarters the same day. The journey from Patna to Muzaffarpur, which even in pre-earthquake days occupied more than four hours, became a matter of thirty five minutes. An aeroplane has been placed at the disposal of the Commissioner of Tirhut and he and the Superintending Engineer, Public Works Department, are able to make rapid journeys to places which they could hardly have found time to visit even had road and rail communications been normal.

Aeroplanes were also used to carry medicines and urgent Government letters.

In short the utility of air transport by reason both of its rapidity and its independence of ground communications can seldom have been more clearly demonstrated than in the days succeeding this earthquake.

SECTION V.

ADMINISTRATION.

Civil Aviation Budget.—The provision for civil aviation in 1933 34 and in the forthcoming year 1934 35 is shewn in the table below —

	Budget (1933 34)	Net final appropriation (1933 34)	Budget (1934 35)
	Rs	Rs.	Rs
1 Direction	2,73,400	2,59,872	3,11,300
2 Works .	1 66,400	1,45,808	3 08,100
3 Wireless Services .	3 50 000	3,60,000	4,00,000
4 Grants to Clubs .	1,32 000	1,25,800	1,32,000
5 Other grants for aviation purposes .	41,200	2,99,610	2 38 600
6 Expenditure in England on Scholarships, etc	32,000	36 000	34,000
Total	9,95 000	12,27,090	14,24 000

The increase in the grant for "Direction" in 1934 35 is mainly due to the provision of staff at additional aerodromes and increased provision for aircraft inspection staff

Under "Works", provision has been made in 1934 35 for new capital expenditure—notably the provision of runways at Gaya and the extension of the Administrative building at Karachi In 1933 34, new works were restricted to minor works

The increased grant for "Wireless Services" in 1934 35 provides for the re opening of one station closed in 1931 and the strengthening of the staff at other stations

Under "Grants", there is a large increase in 1933 34 over the original budget provision This covers the investment of capital in Indian Trans Continental Airways Limited (Rs 1 68 000) and provision for the refund of customs duty and remission of landing fees to that company under the head of subsidy (Rs 95 200)—a liability which arose during the course of the year Further expenditure under the same heads is provided in 1934 35—Capital Rs 72 000, Subsidy Rs 1 10 000

Civil Aviation Staff.—The following statement shews the development of the staff of the Civil Aviation Directorate in six years —

	1928-29	1931-32	1934-35
Headquarters—			
Officers	2	3	3
Establishment	21	46	60
Aircraft Inspection—			
Inspectors		1	4
Establishment		2	4
Aerodrome Staff—			
Aerodrome Officers	.	5	7
Establishment and other		6	24

New Appointments—The two remaining students, who were under training in England returned to India and were appointed as Assistant Aircraft Inspectors on probation on the 15th November 1933 One has been posted to Karachi and the other to Delhi

Aerodrome Control—Arrangements were made during the year to place all the aerodromes on the trans India route in charge of Aerodrome Officers or other authorities who carry out the work of Aerodrome Officers The number of Aerodrome Officers is now six distributed as follows —

1 Karachi Air Port—under the administration of the Officer in Charge Airship Base

2 Delhi—Aerodrome Officer

3 Allahabad—Aerodrome Officer

4 Calcutta—Aerodrome Officer

5 Akyab—Aerodrome Officer

6 Rangoon—Aerodrome Officer

In addition a clerk has been placed in charge of the landing ground at Cawnpore and the duties of Aerodrome Officer at Bombay (Juhu) are carried out by Tata Sons Ltd

The Jodhpur Darbar administer the Jodhpur aerodrome on the same system as applies at Government of India aerodromes thus ensuring a very valuable measure of uniformity

Deputation and Tours—Mr F Tymm M C Director of Civil Aviation in India was on deputation in England from the 7th May 1933 to the 30th June 1933 in connection with the arrangements for the operation of the air service from Karachi to Singapore by Indian Trans Continental Airways and Imperial Airways During this period Mr A T Eadon Deputy Director of Civil Aviation acted as Director

The following tours were carried out by the Deputy Director of Civil Aviation in India during the year:—

January—Allahabad, Gaya, Calcutta, Chittagong, Akyab, Rangoon and Burma coast.

March—Bombay.

July—Lahore.

October—Lahore, Karachi, Jodhpur, Ahmedabad.

Petrol Tax Fund.—A sum of Rs. 40,000 was available in this fund for the year 1933-34 and funds were allotted to the following objects:—

(a) Provision of a 10 K. W. shadow bar flood light at Karachi.

(b) Provision of specially designed obstruction lights on the Adcock D. F. W. T. masts at Mingaladon aerodrome.

(c) Financial assistance to 5 Ground Engineers for further training in England. Details of the scheme are given later in this Section.

(d) Helium research. The examination of samples of natural gas from the oil fields of India was continued.

International Conventions.—India was not represented at the 21st Session of the International Commission for air Navigation held at Rome in May 1933 but her interests were entrusted to the British Delegation.

The Convention relating to the liability of air carriers for damage caused to third parties on the ground has been examined and the Government of India have decided to ratify the Convention after the necessary legislation to implement its provisions has been enacted. Steps to that end are being taken. The Convention relating to the cautionary arrest of aircraft has been signed on behalf of India and the question of its ratification is under examination.

Legislation.—Reference was made in last year's Report to the new Indian Aircraft Bill. For some years past the inadequacy of the Indian Aircraft Act, 1911 has been increasingly felt and it was considered that the stage had been reached when it was [illegible] longer possible to control air traffic efficiently or to impl[illegible] India's international obligations without fresh legislation. [illegible] the year 1933 the drafting of the new Bill was completed [illegible] was introduced in the Legislative Assembly on the 10th M[illegible] The Bill extends the rule making powers of the Governor [illegible] in Council to meet modern developments, enables Gov[illegible] give full effect to the provisions of the International C[illegible] and its annexes, establishes certain principles of law and for certain other matters on which legislation has become

The Indian Carriage by Air Bill, giving effect in India to the provisions of the Warsaw Convention relating to international carriage by air was also introduced in the same session of the Assembly. The Bill provides power to the Governor General in Council to make rules applying the provisions of the Warsaw Convention to internal carriage by air also

Indian Aircraft Rules — A number of further amendments to the Indian Aircraft Rules 1920, were made during the year under report They were effected in two notifications No T-51, dated the 4th November 1933 and 20th January 1934, respectively, and were *mainly in respect of the following* —

(a) The rules regarding the airworthiness of aircraft were revised New provisions were introduced in Part II in respect of the "General Conditions of Flying" These provisions relate, *inter alia*, to documents to be carried in aircraft, licensing of W/T apparatus in aircraft, carriage of mails, dropping of articles from aircraft smoking in aircraft, cancellation, suspension, etc, of licences and special provisions relating to licences of members of flying clubs

(b) Medical examination for the renewal of A licences was introduced, in accordance with the decision of the International Commission for Air Navigation Provision was made for the piloting of a public transport aeroplane by a second pilot whose A1 or B licence is not endorsed for that particular type of aeroplane

(c) Part V, dealing with the overhaul and inspection of flying machines was completely revised and a new part dealing with radio electric signals and apparatus was introduced

(d) The customs procedure for aircraft was simplified

(e) The provisions relating to medical examination for A and B licences and flying tests and technical examination for B licences were amended.

(f) Schedule IV relating to Certificates of Airworthiness of aircraft was wholly revised and tests and examinations for Ground Engineer's licences prescribed

Prohibited Areas —Till April 1933, practically the whole of North-West India was prohibited to the navigation of civil aircraft The question of relaxing this restriction to allow civil aircraft to fly at least as far as Quetta, was examined and a new notification reducing the extent of the prohibited areas in India was issued As a result, certain areas in Baluchistan which were previously prohibited are now open for civil flying

Licences and Certificates.—A statement shewing the number of licences and certificates issued during the year 1933 and comparative figures for 1932 is given in Appendix XIV

The number of private Pilot's licences issued during the year was 96 compared with 104 during 1932 The number of persons who obtained A1 licences (Limited Commercial Pilot) increased from 5 in 1932 to 13 in 1933 and the number of those who obtained B licences from 12 to 18 6 Pilot Instructor's licences and 6 Ground Engineer's licences were issued during the year under review (1933) against 12 and 7 respectively in 1932 The number of aircraft on the register and holding current certificates of airworthiness at the end of the year was 82 and 48 respectively, compared with 70 and 34 at the end of 1932 The total horse power of aircraft on the register at the end of the year was 11 026 compared with 7 420 in 1932 The aircraft registered during the year consisted of—

No of Aircraft	Type of Aircraft	Registered horse power	Total horse power
6	D H 60 Moth (Gipsy I)	85	510
4	D H 60 Moth (Gipsy II or Gipsy III)	105	420
6	D H 83 Fox Moth (Gipsy Major)	118	708
1	D H 80 A Puss Moth (Gipsy III)	105	105
2	D H 84 Dragon (2 Gipsy Major)	236	472
2	G A L 4 Monospar Monoplane (2 Pobjoy R)	150	300
2	A W XV Atalanta (4 Serval III)	1 300	2 600
1	Low Wylde Drone (Douglas)	6	6
1	Comper Swift (Pobjoy R)	75	75
25			5 196

Notices to Airmen—The growth of administrative work in connection with aviation is illustrated by the continued expansion of the Notice to Airmen system 51 Notices to Airmen were issued during the year as against 42 during 1932

Civil Aviation Scholarships—In pursuance of the policy of assisting Indians to qualify for and obtain posts in aviation five ground engineers were selected from those available with most experience and in possession of ground engineer's licences in certain categories they were sent to England to acquire experience of aircraft and engine manufacture and repair and to obtain licences in Categories B and D This has been made possible by the co-oper[illegible] group of companies Two are em[illegible] period which will extend to 2½ year[illegible] engine factories and one is being trained for a period of one year as an oxy acetylene welder The scheme is being financed from the petrol tax fund

Financial assistance and a scholarship have also been granted to a research student who has for some years been studying in England The purpose of this grant is first to assist the student to develop his natural bent for design work and secondly to ensure a fuller investigation of the properties of a device relating to aeroplane wings which has been patented by the student

SECTION VI.

AIRCRAFT INSPECTION.

During the course of 1933 95 aircraft held current certificates of registration whilst 64, representing 68 per cent of the total number registered, held current certificates of airworthiness The percentage of aircraft holding current certificates of airworthiness to those capable of flight during the year would have been appreciably higher but a number of aeroplanes although still registered are known to have been quite unserviceable and in many cases will never be flown again Action is now being taken to withdraw the certificates of registration of such aircraft There is also a number of foreign built aircraft in India for which certificates of airworthiness could never be granted as they do not comply with the design requirements adopted in India Most of these aeroplanes whilst still in a flyable condition, are used only occasionally The significance of these figures is that certification of airworthiness is not compulsory for private aircraft, the reasons for which were fully discussed in last year s Report

The following table gives the number of aircraft of various types which held current certificates of registration and certificates of airworthiness during 1933 —

Type of Aircraft	Registered			Holding
	Private	Commercial.	Total	Cs of A
D H 9	3	0	3	0
D H 60 Moth	13	25	38	31
D H 80 A 'Puss Moth	11	5	16	11
D H 83 'Fox Moth'	1	6	7	7
D H 84 'Dragon Moth'	0	2	2	2
AW XV 'Atalanta'	0	2	2	2
Blackburn 'Bluebird'	2	2	4	4
Comper 'Swift'	2	1	3	2
Monospar	1	2	3	2
Avro Avian	3	0	3	1
Miscellaneous including eight foreign built aircraft	14	0	14	2
	50	45	95	64

A measure of the airworthiness of aircraft registered in India may be deduced from the percentage of flying accidents due to material failures i e failure of the aircraft structure including its controls the power plant and equipment During 1933 only 2 1 per cent of flying accidents were due to material failure there being only two accidents in which a portion of the blame was attributed to the material Both cases are attributable to bad maintenance One case was due to partial engine failure owing to the presence of a nut in the combustion chamber of one of the cylinders The manner in which it gained access into the engine was never discovered In the other case certain control cables were adjusted too tightly resulting in a certain stiffness which detracted from the normal feel of the controls

The increase in multi engined aeroplanes shewn in this Section and Section V, entailed proportionately far more inspection work than the small single engined aeroplanes which constituted the whole of the aircraft in India during previous years In November 1933 the inspection staff which up to then had comprised one Aircraft Inspector and one Assistant Aircraft Inspector was augmented by the appointment of two Indian trainees as Probationary Assistant Aircraft Inspectors They are now gaining experience of practical inspection work and the adaptation of European inspection methods to Indian conditions

Arrangements have been made to purchase additional inspection equipment Principal among the new equipment are a ' Vickers' Pyramid Hardness Testing Machine and a ' Hounsfield Tensometer The first is used to test certain physical properties of the material in aircraft parts (*e g* gear teeth bearings and streamline wires) without rendering the parts unserviceable It will be used mainly in connection with parts of engines undergoing overhaul particularly for heat treated parts the strength property of which may have changed during use It may also be used for testing parts made locally, and on defective or fractured parts The Hounsfield Tensometer will be used mainly to investigate defects and failures It will enable the accurate determination of the tensile strength and certain other physical properties of parts such as connecting rods crankcases and valve stems or heads to be made from test pieces cut from defective parts It may also be used for testing and approving raw material obtained locally for structural repairs

Attention has been given to the improvement of the quality of the petrol available for aviation particularly in relation to its anti detonation rating both by the petrol supply companies and by the Government Departments concerned Detonation involves a sudden and excessive rise in pressure in the cylinders of an internal combustion engine and frequently results in failure of the working

parts particularly connecting rods, crankcases crankshafts bearings and pistons Further when detonation occurs the working temperature of the engine rises and this may in turn lead to further detonation and so set up a vicious circle Detonation particularly, in aircooled engines is therefore partly a concomitant of the high temperatures prevalent in India

In the past fuel tests have been carried out abroad at considerable expense inconvenience and delay To enable fuel tests to be carried out in India arrangements are now being made for the Indian Stores Department to install a C F R fuel testing unit at their Alipore Test House At one time during the year it was necessary to use a benzol mixture for some of the engines in use Later an ethylised fuel was made available which complied with the anti-knock rating requirements In 1934 however an unadulterated petrol of higher quality was placed on sale and this eliminated the necessity for using mixtures It is hoped that the improved fuel will result in an improvement of engine reliability though the tendency on the part of engine designers to raise compression ratios necessitates constant corresponding improvement in fuels A cause of detonation common in India is overheating due to weak fuel mixture arising from an attempt to reduce petrol bills by using undersized jets or too much altitude control

Arrangements have been made for testing oils in India Some kinds of oil produce excessive carbon and sludge due to the higher working temperature of engines in this country

A minor modification in the system of issuing Ground Engineer s licences has been introduced Experience has shewn that the examination which is both practical and oral is insufficient in itself to determine whether a candidate will make a satisfactory ground engineer Close supervision of the actual work of the engineer during the early stages of his operation is not only the best guide to his capacity and suitability for the work but itself contributes to his ultimate success New licences are therefore endorsed Valid only for operation under approved supervision This supervision may take the form of supervision by a Government inspector or by an experienced ground engineer

In March 1934 an Inspectors Conference was held at Delhi to
f the British and Indian
astern extremity of the
tors which came under
ion of ground engineers
modifications overhauls and repairs of aircraft and engine investigation of defects and failures testing of fuels oils and other materials and the storage and distribution of spares

SECTION VII:

GROUND ORGANISATION.

Budget.—A sum of Rs. 1,66,400 was provided for works services in the budget estimates for 1933-34, but the provision was subsequently reduced to Rs. 1,45,808. The original and final allocations were as follows:—

	Budget Provision	Revised Allocation
	Rs.	Rs.
(i) Minor works .	10,000	34,800
(ii) Construction of a hard runway at the civil aerodrome at Akyab	31,900	31,900
(iii) Consolidation and drainage of a portion of the landing ground at the civil aerodrome at Rangoon	18,100	1,200
(iv) Land and survey charges at Rangoon, Dum Dum and Juhu	..	5,933
(v) Maintenance and repairs	75,000	58,719
(vi) Departmental charges	31,400	13,256
	1,66,400	1,45,808

Akyab runways.—The construction of one runway with two turning circles at the civil aerodrome at Akyab was completed. The runway is sited in a direction N. N. E.—S. S. W. along one of the narrow arms of the landing ground. This direction is practically coincident with the prevailing wind during the monsoon and the completion of the work has been of considerable help to the regular operation of the air services. The runway is constructed in brick macadam. The Akyab landing ground remains a very restricted one and although one of the most important in India cannot be made into a first class aerodrome until funds on a considerable scale are available.

Rangoon.—A sum of Rs. 16,900 plus departmental charges (Rs. 25,000) which was originally provided in the budget for the consolidation of a portion of the Rangoon aerodrome was surrendered. Owing to the natural consolidation of the ground it was decided not to proceed with the work but to direct the funds to the acquisition of land for the improvement of the approaches to the aerodrome. This acquisition could not be completed until the following year.

Aerodrome lighting.—Of the two 5 K. W. 'Chance' mobile flood lights purchased last year, one has been loaned to the Jodhpur Darbar for use at Jodhpur till such time as the Darbar provide their

own floodlight For the greater part of the year both Karachi and Jodhpur floodlights have been in operation and a considerable amount of night flying on this section of the route has been done The maximum observed range of the beacon is 80 miles the Karachi beacon has been seen from near Hyderabad (Sind)

A Chance 3rd order 10 K W Revolving beacon floodlight, fitted with a shadow bar has been installed at Karachi mounted on the roof of the administrative building on the west side of the ground The existing 5 K W mobile floodlight will be transferred to another aerodrome as soon as operation procedure for the 10 K W light is satisfactorily settled and it is taken into regular use

A G E C 9 K W floodlight will shortly be installed by the Company at Dum Dum for experimental and demonstration purposes All lighting equipment is regarded as experimental and the cost has been met from the Petrol Tax Fund provided for experimental purpose

Minor works.—The accumulation of arrears of work together with a rapid growth in demand for minor facilities necessitated the devotion of all available funds to an attempt to provide the most pressing necessities No one work was of sufficient magnitude to require more than brief mention but the cumulative effect of improvements carried out at an expenditure of Rs 36,000 has materially improved the conveniences and amenities of the aerodromes mostly lying on the trans India route The work included such items as provision of lavatories for passengers and staff construction of offices in hangars construction of quarters for clerks and menials who are required to be available for operations at all hours provision of rollers carts and other aerodrome equipments, special work on the new lay out of Cawnpore referred to elsewhere Of greater specific effect were two items at Rangoon and Calcutta—the cutting of trees along the Prome Road at Mingaladon has materially improved the approach to the aerodrome though much improvement is still required and at Dum Dum the hangar has been re wired and the interior lighting improved while tarmac floodlights have also been provided

Cawnpore.—A development of major significance was the handing over of the Cawnpore aerodrome by the Army to Civil Aviation in June Cawnpore was selected as a stopping place on the trans India service It is also the headquarters of the Cawnpore branch of the United Provinces Flying Club It is expected that it will become an important commercial aerodrome Arrangements have therefore been made covering its use for a period of ten years Additional military land has been thrown into the landing area providing landing dimensions of approximately 800 yard and good road approaches which were previously non existent The United Provinces Flying Club have already erected their hangar on the new building area adjoining the road and the transfer of refuelling installations and buildings is in progress

Madras —Similar arrangements have been made to take over the Madras aerodrome for a period of ten years from the Royal Air Force and to develop it as a civil aerodrome A new lay out is being planned

Victoria Point and Tavoy —Pursuant to the policy of gradual substitution of civil control of the landing grounds on the trans India route the landing grounds at Victoria Point and Tavoy were taken over from the Royal Air Force on 1st April 1934 The Administrative control of Victoria Point has been improved by the appointment of a local resident as aerodrome authority

Private aerodromes —The construction of private aerodromes during the year marks the opening of a new phase Hitherto while landing places may have been temporarily prepared they had not been placed on a recognised permanent basis Certificates of approval as aerodromes for regular use for the carriage of passengers were issued to the following —

Name	*Position*	*Proprietor*
Chettinad	Madras Presidency 43 miles S of Trichinopoly	Raja Sir Annamalai Chettiar of Chettinad
Maheshganj	Bengal Presidency 61 miles N of Calcutta	Mr R Pal Choudhri

The revival of flying Lahore through the Northern India Flying Club brought the Lahore (Kot Lakhpat) aerodrome into operation again This aerodrome is controlled by the Northern India Flying Club

Provisional approval was also given to the use of the landing grounds at Puri Vizagapatam and Gannavaram (near Bezwada) by the Madras Air Taxi Service in connection with the temporarily operated Madras Calcutta service

A number of landing grounds was constructed in Northern Bihar by private or local enterprise all of which were within the earthquake zone and all of which were more or less seriously damaged These included Hathwa Monara Purtabpore and Muzaffarpur Repairs have been effected in most cases but certificates of approval have not yet been issued The landing ground at Darbhanga (Darbhanga State) was similarly damaged

Indian States —The Jodhpur Darbar continued its progressive air policy Three additional landing grounds at Cadra Road, Merta Road and Tilwara all on the trans India route, have been constructed A picketing base has been made at the Jodhpur aerodrome where a hard runway has also been constructed and the aerodrome hotel enlarged The Darbar is also considering plans for aerodrome lighting

The following other landing grounds in Indian States have been constructed — Limbdi Loharu Dholpur Udaipur and Patiala A landing ground at Bhopal has also been partially prepared which, however is sited on black cotton soil and will be unusable in the rains until runways have been constructed The State requires a week's notice of the intention to land at this aerodrome

Wireless Services — A brief account by the Director of Wireless of the wireless services that were available for air navigation in India during the year under report is given below —

During the year 1933 34 the wireless station (including direction-finder) at Gaya and the direction finding stations near Delhi and Allahabad remained closed but arrangements were made for the re opening of the Gaya wireless station in April 1934 The work of modernising the wireless station at Victoria Point together with the provision of a direction finder was completed Preliminary arrangements were made for the construction of a new wireless station at Tavoy in Lower Burma the work was approved by the Government of India and funds provided for the year 1934 35 this station should afford useful facilities for aircraft flying between Rangoon and Singapore either by the west coast of the Malay Peninsula or following the longer route via Bangkok The proposed fitting of wireless apparatus in the air mail machines of Messrs Tata Sons Ltd flying on the Karachi Bombay Madras Service did not materialise

Arrangements for the interchange of meteorological information between wireless stations on the regular air route between Karachi and Victoria Point were augmented and worked satisfactorily The work at the wireless stations increased considerably during the year owing to the opening by successive stages of the trans India air service between Karachi and Calcutta Rangoon and Singapore communication was also arranged in connection with a number of special flights by R A F and commercial machines both British and foreign

During the calendar year 1933 the number of wireless messages in connection with aviation was approximately as follows —

(a) Messages exchanged between aircraft and ground stations	10 900
(b) Messages exchanged between ground stations themselves	40 800

Meteorological Services —The utility of the meteorological service provided for aviation may be judged from the following note prepared by the Director General of Observatories showing the work done and developments which took place during the year —

The Meteorological Department was called upon to meet new demands for weather reports in connection with the new air mail services on the Karachi Victoria Point Calcutta Dacca and

Madras Calcutta routes The meteorological needs of the trans India air route over which three regular weekly mail services operated each way, continued to be served by the forecasting offices at Karachi and Calcutta In addition the Karachi office forecasted for the Karachi Ahmedabad section of the Tata Sons Madras Karachi air mail service while Calcutta forecasted for the Calcutta Dacca and Calcutta Rangoon services of Indian National Airways, Ltd Poona remained the sole forecasting office in South India with facilities for preparing only one weather chart and forecast per day, to serve in addition to its general weather duties the needs of the regular air mail service between Madras and Ahmedabad

In connection with the Karachi Madras air mail service three new pilot balloon observatories at Malegaon Bombay (Colaba) and Bellary were started during the year arrangements were made for communicating current weather information by land line telegraph to certain aerodromes from observatories situated at a

weather

was con

nd useful

to the mail aeroplane In order to fit in with the Imperial Airways Arabian Coast route between London and Karachi a 2nd class surface Observatory was started at Sharjah The question of starting a pilot balloon observatory there was looked into but had to be postponed for want of suitable accommodation

The Current Weather Report scheme introduced during the previous year on the wireless chain along the trans India air route was extended so as to include voluntary reports containing immediate warnings of the setting in and disappearance of adverse weather With the co operation of the Manager Imperial Airways Cairo the scheme of voluntary reports of dangerous phenomena was introduced at Gwadur and Bahrein also

In addition to the two routine observations in the early morning and at noon the stations participating in the Current Weather Report scheme were asked to record three more routine observations viz at 10 00 15 00 and 17 30 hours daily These observations which are merely for record until the wireless service can handle the extra traffic involved in their exchange between the several stations are expected to furnish valuable statistics of such climatological factors as are referred to in Annex G to the International Convention for the Regulation of Aerial Navigation Current weather stations on the Tata air mail route were also asked to record 7 observations as a daily routine for a similar purpose

During the calendar year 1933 about 4 9 0 weather reports and route forecasts were issued to civil aviators (including regular services) of which 3 800 were supplied by Karachi 860 by Calcutta and about 290 by Poona

The number of upper wind reports supplied to aircraft, the number of special observations of current weather supplied on request to aeroplanes in flight, in addition to routine reports exchanged by W/T and the number of warnings of adverse weather and improvement thereof issued by stations along the trans India air route are given in the following table —

Name of Station	No of upper wind reports supplied	No of current weather reports supplied	No of 'danger-ment and improvement' messages (issued between 1st July and 31st December 1933)
Karachi	1 100	49	16
Jodhpur		87	4
Delhi		19	2
Allahabad	151	79	9
Calcutta	100	83	18
Chittagong	2	134	8
Akyab	19	210	35
Sandoway	1	118	12
Bassein		215	6
Rangoon	104	222	4
Victoria Point	66	18	8

Sixteen special current weather reports were supplied by observers along the Ahmedabad Bellary route for the Tata air mail service, in addition to 400 routine current weather reports

Facilities were given to pilots and other aviators to study the weather charts and to discuss meteorological situations with the meteorological officers Three candidates for Pilot s B licence were trained or examined in Elementary Meteorology at Poona 1 at Agra and 2 at Karachi, and 1 candidate for 2nd class Air Navigator s licence trained at Karachi in Elementary Meteorology

The following items of information were supplied on request in connection with the selection of air routes —

1 Weather conditions over Jodhpur Rawalpindi route (*via* Bikaner and Lahore) and over Karachi Lahore route (*via* Jacobabad) to Indian National Airways

2 Climatology of the air route Rawalpindi Srinagar during June September to Bombay Flying Club

3 Normal rainfall charts and storm track charts with an explanatory note about movement of depressions between Singapore and Calcutta to the Director of Civil Aviation

4 Winds for December along Calcutta Madras route to Tata Sons, Ltd

APPENDIX 1.

Karachi-Bombay-Madras Air Mail Service.

Period	Services			Aircraft mileage	Passengers		Freight	Mails	
	Scheduled	Completed	Per centage regularity		Number	Passenger miles		South bound	North-bound.
							lbs	lbs	lbs
1932—(17th October—31st December) . . .	23	23	100	35,720	1	660	53	1,464	1,510
1933—									
March quarter .	25	25	100	33,000	1	660	70	1,936	1,982
June quarter . . .	26	26	100	34,320	2	2,055	81	2,056	2,304
September quarter . .	27	27	100	35,640	2	390	96	2,921	3,390
December quarter	26	26	100	34,320	3	1,980	46	3,433	5,473
Total for 1933 .	104	104	100	137,280	8	5,285	293	10,316	13,139

APPENDIX II.

Delhi-Karachi Air Mail Service

Period	Services.			Aircraft mileage	Passengers		Freight	Mails		Remarks
	Scheduled	Completed	Percentage regularity		Number	Passenger miles		West bound	East bound	
							lbs	lbs	lbs	
1932	104	101	97	71,760	6	2 309		4 730	5 336	Misconnections due one to engine failure and two to weather
1933— March quarter	26	26	100	17 940	2	990		1 585	1,104	
1st April to 5th July	28	26*	93	19 020				1 606	1 280	
Total for 1933	54	52	96	36,960	2	990		3 191	2,384	

*Excludes two flights when service did not connect with Imperial Airways westbound service. The mails were carried by Air Orient up to Baghdad where they connected with Imperial Airways.

NOTE.—This service terminated on the 5th July, from which date it was replaced by the Trans India Service operated by Imperial Airways Limited, and Indian Trans Continental Airways Limited.

APPENDIX III

Indian National Airways' Calcutta Rangoon Service

	Services			Aircraft mileage	Passengers		Freight	Mails	
	Scheduled	Completed	Per centage regularity		Number	Passenger miles		East bound	West bound
1933—December	9	9	100	6 900	12	31,500	lbs 1 37	lbs 34	lbs 48

Service commenced 1st December 1933

APPENDIX IV

Indian National Airways' Calcutta Dacca Service

	Services			Aircraft mileage	Passengers		Freight	Mails	
	Scheduled	Completed	Per centage regularity		Number	Passenger miles		East bound	West bound
1933—December	62	62	100	9 500	105	15,750	lbs 662	lbs 21	lbs 75

Service commenced 1st December 1933.

APPENDIX V.

Trans India Service (Karachi-Calcutta-Rangoon-Singapore)

Period	Services			Aircraft mileage	Passenger ton miles	Freight ton miles	Mail ton miles	Mails	
	Scheduled	Completed	Percentage regularity					East-bound	West-bound
								lbs	lbs
1933—									
September quarter	25	24	96	[illegible]	3,117	448	4,879	[illegible]	6,192
December quarter	26	26	100	[illegible]	[illegible]	1,073	[illegible]	[illegible]	[illegible]
Total 1933	51	50	98	[illegible]	12,111	[illegible]	[illegible]	[illegible]	[illegible]

APPENDIX VI.

Scheduled Air Services to and from India

Air Mails to India

	Imperial Airways		K L M		Air Orient or Air France		Total
	Ordinary mails	Transit mails	From Europe	From the East	From Europe	From the East	
	lbs	lbs	lbs	lbs	lbs	lbs	lbs
1929 (9 months)	21 967	16					21 983
1930	39 364	359	96			..	39,819
1931	45 632	840	1 047	No record	318	No record	47 837
1932	45 111	1 766	3 216	1,306	458	79	51,996
1933—							
March quarter	12 140	691	1 110	518	233	41	14 733
June quarter	12 566	757	1 158	598	180	68	15 327
September quarter	13 984	903	1 160	203	132	159	16 541
December quarter	16 505	1,777	1 303	Not available	289	Not available	19 874
Total 1933	55 195	4 128	4 731	1,319	834	268	66 475

Air Mails from India.

	Imperial Airways		K L M	Air Orient or Air France	Total
	Ordinary mails	Transit mails	To the East	To the East	
	lbs	lbs	lbs	lbs	lbs
1929 (9 months)	20 171	485			20 656
1930	34 015	2 561			36 576
1931	40 474	2 592			43 066
1932	42 407	4 299	117	14	46 837
1933—					
March quarter	11 516	1 376	177	35	13 104
June quarter	12 165	1 309	360	88	13 922
September quarter	14 500	1 452	394	133	16 479
December quarter	15 997	1 839	529	168	18 533
Total 1933	54 178	5 976	1 460	424	62 039

APPENDIX VII

Scheduled Air Services—Regularity and Punctuality

(Karachi Air Port)

Services and Period	Eastbound Arrivals						Westbound Departures					
	Scheduled flights	Punctual	Delay			Cancelled	Scheduled flights	Punctual	Delay			Cancelled
			1 day	2 days	3 days or more				1 day	2 days	3 days or more	
1931—												
Imperial Airways	52	35	8	6	3		3	43	6	3	1	
K L M	26	16	5	2	3		24	18	[illegible]		1	
Air Orient	18	13	3	2			17	13	3	1		•
1932—												
Imperial Airways	53	36	6	7	4		[illegible]	50	1		1	
K L M	52	32	13	6	1		2	43	6	3		•
Air Orient	43	33	7	3			43	31	9	3	1	
1933—												
Imperial Airways	52	45	4	2	1		52	50		2		•
K L M*	52	30	12	3	1		53	43	2	2		
Air France	52	42	8	2			52	49	2		1	•

*In addition to the scheduled flights, K L M ran one extra east and westbound Christmas mail

APPENDIX VIII.

Traffic return of scheduled air services to and from India (Karachi) excluding Air Mails

	No. of flights	Passengers		Freight (including bullion)	
		To India.	From India	To India	From India
Imperial Airways				lbs	lbs
1929 (9 months)	80	No record	No record	No record	No record
1930	105	78*	70*	No record	No record
1931	104	80†	74†	5 489	313
1932	103	150	142	5 073	266
1933—					
March quarter	26	29	41	2 063	178
June quarter	30	46	58	2 372	1 422
September quarter	27	60	67	2 486	2 132
December quarter	26	81	45	2 489	1 297
Total 1933	109	216	211	9 410	5 029
Foreign Services					
1931	106	32†	18†	698‡	43‡
1932	190	16†	30†	1,231	2 686
1933—					
March quarter	52	11	8	716	140
June quarter	58	1	17	1 083	100
September quarter	59	19	21	813	78
December quarter	53	20	18	1 433	73
Total 1933	222	50	64	4 045	390

* Figures for the financial year 1930-31

† No figures for the first quarter: figures relate to last 9 months

‡ No figures for the first half year

Traffic return of scheduled air services to and from India (Rangoon) excluding Air Mails

	No. of flights	Passengers		Freight	
		To India	From India	To India	From India.
Imperial Airways and Indian Trans Continental Airways				lbs	lbs
1933—December quarter	2		3		
Foreign Services					
1932	100	41	28	198	1 351
1933—					
March quarter	52	47	38	11	
June quarter	53	17	23	60	
September quarter	54	22	10	23	34
December quarter	53	22	6	6	
Total 1933	212	108	77	100	34

APPENDIX IX

Indian Air Ports

	Aircraft		Imports by Air		Exports by Air	
	Arrivals from foreign	Departures for foreign	Merchandise	Bullion and currency notes	Merchandise	Bullion and currency notes
Karachi			Rs	*Rs*	Rs	Rs
1931	122	111	1 50 601	1 08 801	4 [illegible]	[illegible]
1932	174	161	8 26 978*	33 [illegible]	1 [illegible]	[illegible]
1933—						
March quarter	47	42	14 11 043	20 017	[illegible] 413	[illegible]
June quarter	51	49	11 8[illegible] 84[illegible]	8 [illegible]	9 [illegible]	1 0[illegible]
September quarter	44	42	1[illegible] 44 84[illegible]	3 [illegible] 0	1[illegible] 18[illegible]	[illegible]
December quarter	55	51	12 17 881	1 4[illegible] 0	19 [illegible]	
Total 1933	197	184	50 56 614†	1 77 33	[illegible]	1 02 [illegible]
Rangoon						
1931	57	65				4 [illegible]
1932	96	107	1 808	—	[illegible]5	[illegible]
1933—						
March quarter	25	30	74			
June quarter	29	28	1 416			
September quarter	29	28	480			
December quarter	36	32	1 7[illegible]7			
Total 1933	119	118	3 697			

* Includes Rs 4 17 722 (mostly diamonds) imported at Karachi but assessed at Bombay
† Includes Rs 31 48 685 (mostly diamonds) imported at Karachi but assessed at Bombay
Includes Rs 11 42 674 imported at Karachi but assessed at Calcutta
Includes Rs 86 204 merchandise imported at Karachi but assessed at *Calcutta*

APPENDIX XII.

Flying Accidents—Indian Aircraft.

Analysis of Causes.

—	1933	1932	—	1933	1932	—	1933	1932
	Per cent	Per cent		Per cent	Per cent		Per cent	Per cent
Personnel	85.7	67.5	Errors of Pilot	85.7	67.5	Errors of Judgment	33.2	24.5
						Poor Technique	32.3	12.4
						Disobedience of Orders	3.4	6.1
						Carelessness or Negligence	16.8	
Material	2.5	18.7	Power Plant Failure	2.3	9.7	Engine structure (1)		87
			Structural Failure		10	Foreign Matter (2)	2.3	
			Handling qualities (4)	2		Flight Control System (3)		10
						Handling qualities (4)	2	
Miscellaneous	12.1	9.0	Weather	5.2	5		3.4	5
			Airport or Terrain	1.1			.7	
			Other (5)	5.7	3.8		5.1	3.8
Undetermined or Doubtful		5			5			5

(1) This consisted of three valve seat failures
(2) This was attributed to the presence of a nut inside one of the engine cylinders which resulted in misfiring and partial engine failure
(3) This occurred on an unregistered and unlicenced aircraft
(4) Due to flying controls being adjusted too tightly
(5) Includes collisions with birds, people in the way on landing etc

APPENDIX XIII.

Major Accidents—Indian Aircraft

	1933	1932
(1) Aircraft hours flown	15 240	11 550
(2) Aircraft miles flown (Approx.)	1,200 000	992 000
(3) Accidents involving fatalities—		
(a) Crew	0	1
(b) Passengers	0	1
(c) Other persons	0	0
(4) Non fatal accidents involving serious injuries—		
(a) Crew	3	2
(b) Passengers	0	0
(c) Other persons	0	0
(5) Number of killed—		
(a) Crew	0	1
(b) Passengers	0	1
(c) Other persons	0	0
(6) Number of seriously injured—		
(a) Crew	3	2
(b) Passengers	0	0
(c) Other persons	0	0
(7) Miles flown per fatality	∞	496 000
(8) Miles flown per serious injury or fatality	400 000	248 000

APPENDIX XIV.

Licences and Certificates issued and current during 1932 and 1933

Licences and Certificates	Issued during 1932	Issued during 1933	Total issued to end of 1933	Lapsed to end of 1933	Current on 31st December 1932	Current on 31st December 1933
1. Pilots' 'A' Licences . . .	104	98	483	267	196	216
2. Pilots' 'A 1' Licences (Limited Commercial Pilot) . . .	5	13	18	10	5	8
3. Pilots' 'B' Licences . . .	12	18	113	70	27	43
4. Pilot Instructors' Licences . .	12	6	18	2	10	16
5. Ground Engineers' Licences . .	7	6	53	30	19	23
6. Certificates of Airworthiness .	20	29	108	60	34	48
7. Certificates of Registration* .	19	25	142	60	70	82

* The figures include only new Certificates issued. Figures of aircraft re-registered have been excluded.

GIPD—M 57 (A) Dr. of Civil Aviation—31-8-34—160.